Indoor Location Tracking Project Files

Indoor\_Tracking\_Math.ipynb

* This is a deprecated file that performs simulated tests of trilateration to ensure I figured out the math correctly. It uses an OOP approach to create wifi nodes with given signal strengths and distances from an imaginary point. This file is not used in the final analysis, but I believe is still useful for understanding the project and checking out simulated accuracy.

Locate\_APs.ipynb

* This is a Jupyter Notebook that is used for scanning an area for network Access Points. A user inputs their absolute X, Y, and Z coordinates so there is a reference to location. This is stored with all networks ID’s and signal strengths into a CSV file. This CSV is used in later analysis to locate WiFi nodes.

/data/wifi\_scan\_results.csv

* This CSV file is the output from Locate\_APs.ipynb . It contains scan results for WiFi access points based on MAC address. It lists signal strength at each scanned X, Y, Z coordinate.

Reverse\_Trilaterate.ipynb

* This is a Jupyter Notebook that is used to trilaterating the location of WiFi access points given their signal strengths relative to an absolute location. This reads in the wifi\_scan\_results.csv and performs trilateration. This outputs a CSV with estimated absolute locations for each AP based on MAC address.

/data/estimated\_positions.csv

* This CSV file is the output from Reverese\_Trilaterate.ipynb . It contains trilaterated results for estimated X, Y, and Z positions for each scanned access point based on MAC address.

Wifi\_Trilateration.ipynb

* This file is the true trilateration using WiFi access points. It takes in the estimated positions for access points, scans for wifi at the current user position, and makes a prediction for user location. This data is saved later to CSV for analysis.

/data/current\_poistions.csv

* This is the output results of Wifi\_Trilateration.ipynb . It contains estimated user positions based on wifi access point scans.